

WHAT IS CLAIMED IS:

1. A monolithic sputtering target assembly comprising a one piece assembly made from the same metal.
- 5 2. The monolithic sputtering target assembly of claim 1, wherein said metal comprises tantalum.
3. The monolithic sputtering target assembly of claim 1, wherein said metal comprises niobium.
4. The monolithic sputtering target assembly of claim 1, wherein said metal
10 comprises cobalt.
5. The monolithic sputtering target assembly of claim 1, wherein said metal comprises titanium.
6. The monolithic sputtering target assembly of claim 1, wherein said metal comprises a valve metal.
- 15 7. The monolithic sputtering target assembly of claim 1, wherein said one piece assembly comprises a sputtering target blank portion and a backing plate portion.
8. The monolithic sputtering target assembly of claim 7, wherein said backing plate portion comprises a flange portion.
9. The monolithic sputtering target assembly of claim 7, wherein said
20 sputtering target blank portion is at least partially recrystallized.
10. The monolithic sputtering target assembly of claim 7, wherein said at least a portion of said backing plate portion is not recrystallized.

11. The monolithic sputtering target assembly of claim 8, wherein said flange portion has a higher yield strength and/or is more rigid than said sputtering target blank portion.

12. The monolithic sputtering target assembly of claim 1, wherein said metal
5 has a purity of from about 99.5% or greater.

13. The monolithic sputtering target assembly of claim 1, wherein said metal has an average grain size of about 300 microns or less.

14. The monolithic sputtering target assembly of claim 1, wherein said metal has an average grain size of 100 microns or less.

10 15. The monolithic sputtering target assembly of claim 1, wherein said metal has an average grain size of about 25 microns or less.

16. The monolithic sputtering target assembly of claim 1, wherein said metal has a texture of (111) on the surface or throughout said metal.

17. The monolithic sputtering target assembly of claim 1, wherein said metal
15 has a texture of (100) on the surface or throughout said metal.

18. The monolithic sputtering target assembly of claim 1, wherein said metal has a primary or mixed (111) texture throughout said metal.

19. A sputtering target assembly comprising a backing plate and a sputtering target blank, wherein said backing plate comprises a valve metal, cobalt, titanium, or
20 alloys thereof, and said sputtering target blank comprises a metal.

20. The sputtering target assembly of claim 19, wherein said backing plate and said sputtering target blank comprise the same metal.

21. The sputtering target assembly of claim 19, wherein said sputtering target blank and said backing plate are tantalum.

22. The sputtering target assembly of claim 19, wherein said sputtering target blank and said backing plate are niobium.

23. The sputtering target assembly of claim 19, wherein said sputtering target blank and said backing plate are titanium.

5 24. The sputtering target assembly of claim 19, wherein said sputtering target blank and said backing plate are cobalt.

25. A method of recycling a sputtering target comprising providing a monolithic sputtering target assembly of claim 1;

sputtering said monolithic sputtering target assembly to form a spent monolithic
10 sputtering target assembly; and

recycling said monolithic sputtering target assembly.

26. The method of claim 25, wherein recycling comprises melting down said spent monolithic sputtering target assembly.

27. The method of claim 25, wherein said recycling involves filling in any
15 cavities present in said spent monolithic sputtering target assembly.

28. The method of claim 25, recycling comprises redepositing metal on said spent monolithic sputtering target assembly to form a new monolithic sputtering target assembly.

29. A method of doing business comprising providing a monolithic sputtering
20 target assembly of claim 1 to a fabricator where it is sputtered to form a spent target assembly;

determining the amount of target consumed by sputtering; and

charging said fabricator or customer for the amount of target consumed.

30. The method of claim 29, further comprising returning said spent target assembly to a provider.

31. The method of claim 29, further comprising recycling said spent target assembly.

5 32. A method of recycling a sputtering target comprising providing a sputtering target assembly of claim 19;

sputtering said sputtering target assembly to form a spent sputtering target assembly; and

recycling said sputtering target assembly.

10 33. A method of doing business comprising providing a sputtering target assembly of claim 19 to a fabricator where it is sputtered to form a spent target assembly;

determining the amount of target consumed by sputtering; and

charging said fabricator or customer for the amount of target consumed.

34. The monolithic sputtering target assembly of claim 1, wherein said metal is
15 consolidated powder metal.

35. The monolithic sputtering target assembly of claim 1, wherein said metal is an ingot derived metal.

36. The monolithic sputtering assembly of claim 1, wherein a portion of said sputtering target comprises a consolidated powder metal and another portion of said
20 sputtering target assembly comprises ingot derived metal.

37. The monolithic sputtering target assembly of claim 1, wherein said metal has a primary or mixed (111) texture and a minimum (100) texture on the surface or throughout the thickness of the sputtering target assembly, and is substantially void of (100) textural bands.

throughout the thickness of the sputtering target assembly, and is substantially void of (100) textural bands.

38. The monolithic sputtering target assembly of claim 1, wherein said metal has a primary or mixed (100) texture and a minimum (111) texture on the surface or
5 throughout the thickness of the sputtering target assembly, and is substantially void of (111) textural bands.